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Commissioner	:	<u>C. Sandoval</u>
Admin. Law Judge	:	<u>K. Bemesderfer</u>
ORA Project Mgr.	:	<u>Ana Maria Johnson</u>
ORA Witness	:	<u>Enrique Gallardo</u>



Office of Ratepayer Advocates
California Public Utilities Commission

**Office of Ratepayer Advocates Supplemental
Testimony on Backup Power for Remote
Terminals**

Public Version

San Francisco, California
September 11, 2015

MEMORANDUM

This report was prepared by Enrique Gallardo of the Communications & Water Policy Branch of the Office of Ratepayer Advocated (ORA) under the general supervision of Program & Project Supervisor, Ana Maria Johnson. ORA is represented in this proceeding by legal counsel, Lindsay Brown.

A statement of qualifications of Enrique Gallardo is presented in Attachment xx to this testimony.

This supplemental testimony is comprised of the following chapter.

Chapter Number	Description
1	FINDINGS REGARDING BACKUP POWER AT REMOTE TERMINALS – examines the status of Verizon’s provision of backup power to remote terminals.

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Attachments

Attachment A – Statement of Qualifications of Enrique Gallardo

1 **EXECUTIVE SUMMARY**

2 The following testimony presents ORA’s findings and recommendations
3 regarding the impact of the proposed transaction on telecommunications service,
4 including 911 service, as it relates to the maintenance of backup power for remote
5 terminals (“RTs”) in Verizon’s wireline network. As discussed in my July 28,
6 2015 reply testimony, issues related to backup power for RTs¹ affects not only the
7 viability of Voice over Internet Protocol (“VoIP”) services during a power outage,
8 but the viability of all telephone service.

9 For traditional landline service, even when a customer is experiencing a
10 power outage, their telephone service will often still work, as the power will be
11 supplied from the carrier’s central office or from the carrier’s RTs. If the carrier is
12 also experiencing a power outage at the central office, the service provider will
13 generally have backup generators and/or batteries available that will be utilized as
14 soon as they are needed. However, in many cases, the viability of telephone
15 service depends on the continued operation of RTs.² Many RTs may have
16 inadequate sources of backup power – either generators or batteries. The state of
17 Verizon’s RTs is of concern within the consideration of the proposed acquisition
18 by Frontier Communications Corporation (“Frontier”) of assets held by Verizon
19 California and Verizon Long Distance LLC (“Verizon”).

20 **Organization of Report**

21 Chapter 1 of the report discusses the impact of the proposed transaction on
22 backup power for RTs. As mentioned in ORA’s Testimony and
23 Recommendations Regarding Impacts on Employees, Management, the 911
24 System and Backup Power, served on July 28, 2015, ORA reserved the right to

¹ Remote terminals are equipment needed to provide telecommunications service on the provider’s network that are located between the central office, or equivalent for other types of providers, and the customer’s premises. See D.08-09-014, p. 18, n.14.

² See CPUC Backup Power Report, pp. 54-56.

1 include this issue in this Supplemental Testimony. Moreover, the issue of backup
2 power at RTs was discussed by commenters at the public participation hearings
3 and workshops, as detailed below, and is thus a proper subject of Supplemental
4 Testimony.³

5 **Recommendations**

6 ORA recommends specific conditions related to RTs that should be adopted
7 if the Commission approves the transaction. ORA recommends the following:

8 (1) Prior to the consummation of the transaction, Verizon should be
9 required to inspect (and service if required) any batteries serving remote
10 terminals if they have not been inspected within one year or if the
11 batteries have components installed before 2006.

12 (2) Within 180 days the effective date of the transaction, Frontier should
13 provide backup power for at least eight hours at all of its remote
14 terminals in California, through any combination of batteries, generators
15 or other resources.

³ See September 4, 2015 E-mail Ruling of ALJ Colbert Adjusting the Date for Service of Intervenor and Applicant Supplemental Testimony.

1 **1. BACKUP POWER AT REMOTE TERMINALS**

2 **INTRODUCTION**

3 This chapter presents ORA’s findings and recommendations regarding Verizon’s
4 provision of backup power for RTs. As discussed below, the adequate provision of
5 backup power to a carrier’s RTs has implications on maintenance of telephone service
6 during power outages. Thus, this issue affects service quality, access to emergency
7 services, including 911 service, and public safety. The Amended Scoping Ruling issued
8 on July 2, 2015 included in the factors that the Commission would consider in deciding
9 whether to approve the transaction the following question:

10 8. What are the service quality and 911 implications of the transaction for
11 Frontier’s existing and its newly acquired customers?⁴

12
13 Thus, the issue of backup power for RTs is a proper subject for the Commission to
14 consider in evaluating the proposed transaction. Frontier proposes to acquire Verizon’s
15 wireline network that provides both traditional telephone and VoIP service to millions of
16 customers throughout California. This section of the report examines the current state of
17 the provision of backup power to Verizon’s remote terminals.

18 Backup power for RTs in case of a power outage affects the viability of telephone
19 service for many customers. As discussed in ORA’ initial testimony (“ORA Backup
20 Power Testimony”), for traditional landline service, even when customers experience a
21 power outage, their telephone service will often still work, as the power needed for
22 continued service will be supplied from the carrier’s central office.⁵ If the carrier is also
23 experiencing a power outage at the central office, the carrier will generally have backup
24 batteries and/or generators available on-site that will be utilized to keep the service
25 running. Given the critical function and accessibility of central offices, carriers have a

⁴ Assigned Commissioner’s Amended Scoping Ruling, issued July 2, 2015, p. 5.

⁵ See Office of Ratepayer Advocates’ Testimony and Recommendations Regarding Impacts on Employees, Management, the 911 System and Backup Power (“ORA Backup Power Testimony”), served July 28, 2015, p. 3-11.

1 great incentive and relatively easy means to ensure the backup power resources for the
2 central offices are adequate.⁶

3 However, in many cases, the viability of telephone service – especially for rural
4 areas that are geographically distant from a central office – depends on RTs. RTs are part
5 of the telecommunications infrastructure located apart from central offices and serving
6 various communities. The RTs contain network infrastructure, usually within an above
7 ground cabinet or underground vault. The RTs generally receive power from the utility
8 grid.⁷ However, if the utility grid power fails in a local community, it may also fail for a
9 RT. Thus, in order for telecommunications service to be maintained for a community,
10 the RT that serves the community must have adequate backup power resources.

11 **A. Public Participation Hearing and Workshop**
12 **Commenters Noted Backup Power at Remote**
13 **Terminals as an Issue.**

14 The incidence of service outages and the inadequacy of the backup power for RTs
15 were raised at a number of the public participation hearings (“PPHs”) and workshops that
16 were recently conducted in this proceeding. Many commenters noted a high incidence of
17 service outages, or that service took a long time to return after outages.⁸ For example, a
18 PPH commenter who was part of a third-party company that provided broadband service
19 over Verizon’s copper lines in rural northern California stated:

20 With respect to the remote [terminals], one question came up
21 when we were out there was: What happens during a power
22 outage? They've got eight hours worth of battery backup, but
23 you've got at least five terminals in one particular area. I'm

⁶ See also California Public Utilities Commission, Final Analysis Report, *Reliability Standards for Telecommunications Emergency Backup Power Systems and Emergency Notification Systems*, (“Backup Power Report”), May 9, 2008, pp. 29-30, available at <<http://docs.cpuc.ca.gov/PUBLISHED/GRAPHICS/84115.PDF>>

⁷ See Backup Power Report, p. 54.

⁸ See July 6, 2015 Garberville, CA Public Participation Hearing (“PPH Vol. 1”), pp. 14:6 to 15:13; July 8, 2015 Orleans, CA Public Participation Hearing (“PPH Vol. 4”), p. 160:6-15; July 21, 2015 Claremont Public Participation Hearing (“PPH Vol. 6”), pp. 384:15-18.

1 pretty sure they don't have enough generators to keep all that
2 infrastructure going during a storm.

3
4 I know that there has [sic] been numerous E911 outages. I
5 know there has [sic] been other service outages that have got
6 to do with landslides, power outages, all that business. And I
7 think that Frontier is going to have its hands full taking on
8 this network in its current state.²

9
10 Many other PPH commenters expressed concerns about Verizon's provision of
11 backup power to RTs, many basing their concerns on extensive experience in the field as
12 Verizon employees.¹⁰ For example, a retired Verizon employee with 40 years of
13 experience discussed photographs of Verizon's RTs and expressed concerns about the
14 condition and maintenance of the batteries used for backup:

15 These cabinets are supposed to be maintained, check the
16 batteries and check to make sure the fans are working to cool
17 off the cabinet. As you can see by this picture, it looks like
18 with the sand and everything in there, I doubt if anybody has
19 been in there for quite a while.

20
21 The next one, 18 and 19, show the condition of some of the
22 batteries in these cabinets. These batteries basically become
23 active when the electric lines are out of power. These
24 batteries are supposed to automatically come on to keep the
25 service going. By the look of these batteries, some of these
26 batteries are lucky to get a half hour when the service goes
27 out.¹¹

28
29 This same PPH commenter made similar comments at another PPH:

30 Now the second item I'd like to second item I'd like to discuss
31 is the failed backup batteries at remote terminals. They're
32 used when the power goes out at offsite rural locations. The
33 battering [sic.] many times are corroded and do not hold the

² PPH Vol. 1, pp. 17:20 to 18:7.

¹⁰ See PPH Vol. 1, pp. 17:20 to 18:12; PPH Vol. 6, pp. 392:22 to 393:2; July 6, 2015 Garberville, CA Workshop ("WS Vol. 1"), pp. 10:19 to 11:20; July 8, 2015 Orleans, CA Workshop ("WS Vol. 4"), pp. 117:20 to 118:27; July 20, 2015;

¹¹ Rancho Mirage Public Participation Hearing ("PPH Vol. 5"), pp. 247:4-11, 251:14 to 252:1.

1 charge long enough to be useful. These battering [sic.] are
2 supposed to be checked routinely by our technicians and
3 changed out if need be. This does not happen.
4

5 The replacement of these batteries would ensure the
6 customers in the rural areas to have consistent service until
7 regular power is restored. We have reports just through this
8 recent storm that we had major power outages and our backup
9 battering only lasted 4 hours, which would cause the whole
10 system to go down. And anybody that's working on it would
11 be out of service.¹²
12

13 Similarly, another PPH commenter noted that photographs showed batteries that
14 may have been expired:

15 I'm Lisa Shafer with CWA. And I just wanted to mention that
16 Pictures 11, 12, and 13, the pictures of the batteries, they're
17 also expired batteries showing that we have an issue of a lot
18 of expired batteries. So this is just an example. And that
19 wasn't raised when Verizon spoke on the subject.¹³
20

21 As several commenters at the PPHs and workshops raised the issue of outages,
22 specifically regarding the issue of backup power for RTs to address power outages, this
23 issue is a proper focus of Supplemental Testimony, pursuant to the September 4, 2015
24 Ruling of ALJ Colbert. In order to better understand this issue, ORA analyzed data
25 regarding the backup power available to all of Verizon's RTs.

26 **B. Applicable Standards Regarding Backup Power at**
27 **Remote Terminals.**

28 Standards for backup power systems for RTs have been developed and identified
29 by both the Federal Communications Commission ("FCC") and the Commission, but
30 neither agency formally implemented their standards. The Commission developed
31 standards in response to Assembly Bill 2393. AB 2393 was passed into law on
32 September 29, 2006. Among other things, AB 2393 required the Commission to conduct

¹² PPH Vol. 6, pp. 389:16-25, 392:22 to 393:11.

¹³ Aug. 11, 2015 Santa Barbara Workshop ("WS Vol. 11"), pp. 544:11-28.

1 an investigation and submit a report to the Legislature regarding the need for backup
2 electricity to enable telecommunications networks to function in the event of an electrical
3 outage, and to determine performance criteria for the backup power resources.¹⁴ The
4 Backup Power Report was prepared by the Commission’s Communications Division and
5 considered within Rulemaking (R.) 07-04-015, and submitted to the Legislature in
6 Decision (D.)08-09-014.

7 The Backup Power Report considered a number of factors regarding backup
8 power for RTs. For example, the Backup Power Report considered cost factors,
9 including collateral cost effects, available options, the level of implementation of best
10 practices within the telecommunications industry, and the effectiveness of the backup
11 power solutions.¹⁵ The Backup Power Report identified some standards in relation to
12 backup power for RTs, which will be discussed in more detail regarding specific subject
13 matters below. However, the Commission did not formally adopt standards for backup
14 power at RTs, as during the course of R.07-04-015 the FCC had already adopted its own
15 standards regarding backup power for RTs.¹⁶ The FCC’s standards required local
16 exchange carriers and commercial mobile radio service providers to have 24 hours of
17 emergency backup power for central offices and eight hours for cell sites, remote
18 switches and digital loop carrier system remote terminals. Rather than establishing
19 separate backup power requirements, the Commission chose to rely on the FCC standard.

20 The FCC developed the above standard in a proceeding that was initiated in
21 response to the failure of many telecommunications and public safety networks in the
22 aftermath of Hurricane Katrina. An independent panel (“Katrina Panel”) investigated the

¹⁴ See Cal. Pub. Util. Code § 2892.1(b).

¹⁵ See Backup Power Report, pp. 56-68.

¹⁶ See D.08-09-014, pp. 38-39, referencing FCC Order on Reconsideration, In the Matter of Recommendations of the Independent Panel Reviewing the Impact of Hurricane Katrina on Communications Networks, Oct. 4, 2007 (EB Docket No. 06-119, FCC 07-177) (“FCC Katrina Panel Order”), ¶ 4 & Appendix B, proposed rule §12.2.

1 issue and submitted a report with recommendations to the FCC.¹⁷ The FCC then
2 conducted a rulemaking and in 2007 issued its Katrina Panel Order, with the battery
3 backup standard proposed as a federal regulation.¹⁸ However, the FCC did not adopt
4 formal standards for backup power for RTs. The Commission also did not adopt its own
5 standards in R.07-04-015, relying on the recently issued Katrina Panel Order.
6 Nonetheless, both the FCC’s Katrina Panel Order and the Commission’s investigation
7 provide valuable insight into backup power at RTs.

8 The Commission’s Backup Power Report also reviewed Best Practices developed
9 by the Network Reliability and Interoperability Council (“NRIC”), a group formed by the
10 FCC to act as an advisory group. The Commission was charged by AB 2393 to
11 determine whether the best practices recommended by the NRIC for backup power had
12 been implemented by telecommunications service providers in California.¹⁹
13 Responding to AB 2393’s charge, the Backup Power Report surveyed entities within the
14 telecom industry to find, among other things, 1) the extent of the implementation of
15 NRIC Best Practices related to Backup Power, and 2) how effective the respondents
16 found the Best Practices to be.

17 The Backup Power Report concluded that “all segments of the telecom industry
18 with the exception of the Small LECs have very high implementation rates (90% or
19 above) of the NRIC-VII Backup Power Best Practices.”²⁰ Moreover, a great majority,
20 78% of respondents found the Best Practices to be effective, while almost half (47%) of
21 respondents found them to be very effective.²¹

¹⁷ See FCC Katrina Panel Order, ¶ 2.

¹⁸ See FCC Order, In the Matter of Recommendations of the Independent Panel Reviewing the Impact of Hurricane Katrina on Communications Networks, June 8, 2007 (EB Docket No. 06-119, FCC 07-107), as modified on reconsideration by FCC Katrina Panel Order, Oct. 4, 2007.

¹⁹ See Cal. Pub. Util. Code § 2892.1(b).

²⁰ Backup Power Report, p. 65.

²¹ See Backup Power Report, pp. 179-80.

1 The NRIC has been superseded as the advisory body to the FCC by the
2 Communications Security, Reliability and Interoperability Council (“CSRIC”), which has
3 re-adopted many of the NRIC’s Best Practices. The Commission should consider these
4 Best Practices as a proven means of ensuring service quality, continuity of service, and
5 public safety.²²

6 **C. Incidence of Backup Batteries at Remote Terminals.**

7 The most common solution for backup power at RTs is to have a rechargeable
8 battery available at the RT. These batteries are sometimes supplemented by diesel- or
9 propane-powered electric generators, which recharge the batteries or otherwise provide
10 additional power to the RT.²³ In response to a data request from the Commission’s
11 Communications Division, Verizon provided data regarding the backup power
12 provisioned at <<BEGIN CONFIDENTIAL>> [REDACTED] <<END CONFIDENTIAL>> RTs.²⁴
13 Verizon has provisioned <<BEGIN CONFIDENTIAL>> [REDACTED] <<END
14 CONFIDENTIAL>> backup batteries at these RTs, providing at least one battery at
15 every RT.²⁵ There are a number of factors concerning the operational effectiveness of
16 backup power – including the age of the battery, the maintenance of the battery, the
17 number of hours that backup batteries deliver electricity and whether the battery is
18 supplemented by a generator. These factors are discussed below.

19 **D. Age of Backup Batteries.**

20 As batteries age, their capacity to store energy is reduced. Batteries that have
21 deteriorated over time can fail completely, meaning that they will be unable to power a
22 RT. Neither the FCC nor the Commission established a standard for operable age of

²² The CSRIC’s Best Practices are retrievable by reference number or keyword search at
<<https://www.fcc.gov/nors/outage/bestpractice/BestPractice.cfm>>

²³ See D.08-09-014, p. 8.

²⁴ See Response of Verizon to Second Set of Data Requests of the Communication Division, including
attachment CD_VZ2.1_Updated Backup Power Worksheet_Confidential 8-4-2015.xlsx (“Backup Power
Data Response”), attached as Exhibit SC-1.

²⁵ See Backup Power Data Response, attached as Exhibit SC-1.

1 batteries (both agencies focused on the need to periodically inspect batteries, as discussed
2 below). Different batteries age variably, which makes it difficult to give a generalized
3 standard for batteries. A variety of factors – such as protection from the elements and the
4 local climate – also affect the operational age of batteries.

5 In the Santa Barbara workshop for this proceeding, the Engineering Director for
6 Verizon Wireline in California discussed some of the considerations on the operational
7 age of a backup battery:

8 Any particular [Digital Loop Carrier – a type of RT] DLC
9 that is identified as a concern by an employee is always
10 looked at to review and go out and inspect. And we did that.
11 And again, those given terminals and the batteries are still
12 having life within them. Are they old? Okay, 2006, yes. But a
13 battery can have a long life if maintained in the right
14 temperature area. And this is a fairly friendly climate area
15 here for batteries.²⁶

16
17 At the Orleans workshop in this proceeding, the same Engineering Director for Verizon
18 Wireline in California discussed the useful life of a battery:

19 COMMISSIONER SANDOVAL: So a follow-up to that,
20 Alan. What would be the ordinary expected useful life for a
21 battery like what we saw in Hoopa?

22
23 MR. RILEY: A good 8 to 12 years is common on batteries.
24 They are in controlled environments, not subject to what we
25 see out in DLCs where DLCs or remotes. They are impacted
26 by the sun conditions, the heat, or the cold.²⁷

27
28 Although there is no general standard for the age of batteries, we can utilize the
29 number of years identified by Verizon's head engineer as a point where batteries become
30 old. Of the <<BEGIN CONFIDENTIAL>> ██████████ <<END CONFIDENTIAL>> backup
31 batteries serving Verizon's RTs, <<BEGIN CONFIDENTIAL>> ██████████
32 <<END CONFIDENTIAL>> had components that were installed in <<BEGIN

²⁶ WS Vol. 11, p. 547:5-14.

²⁷ See WS Vol. 4, p. 119:1-10.

1 CONFIDENTIAL>> [REDACTED] <<END CONFIDENTIAL>> A total of

2 <<BEGIN CONFIDENTIAL>> [REDACTED]

3 [REDACTED]

4 [REDACTED] <<END CONFIDENTIAL>>.

5 ORA analyzed the data on batteries by county to see if there were any particular
6 regions with older backup batteries. Generally, the older batteries were dispersed without
7 any significant regional pattern. One county that did have a disproportionate amount of
8 older batteries serving their RTs was <<BEGIN CONFIDENTIAL>> [REDACTED]

9 [REDACTED]

10 [REDACTED] <<END

11 CONFIDENTIAL>>

12 **E. Maintenance of Backup Batteries.**

13 Adequate monitoring and maintenance of batteries is critical to ensure proper
14 functioning of the battery. As discussed above, batteries deteriorate at a variable rate,
15 and factors such as exposure to the elements and climate can speed up the deterioration of
16 batteries. There are a number of resources that contain standards for the proper
17 inspection and maintenance of batteries. Perhaps the most important standard is the
18 frequency of inspections.

19 Verizon has service manuals that discuss the maintenance of its wireline facilities,
20 including a number of standards for inspection of the proper functioning of batteries. The
21 standard for the frequency of inspection of a number of battery functions and/or
22 components is <<BEGIN CONFIDENTIAL>> [REDACTED]

23 [REDACTED]

24 <<END CONFIDENTIAL>> Batteries serving central offices, given their critical

²⁸ See Backup Power Data Response, attached as Exhibit SC-1.

²⁹ See Backup Power Data Response, attached as Exhibit SC-1.

³⁰ See Response of Verizon to Second Set of Data Requests of the Communication Division, attachment CD_VZ2.1_Backup Power Ref A_UPS MRD 9-26-14_CONFIDENTIAL, pp. 13-15, attached as Exhibit SC-2.

1 functions, likely require the highest priority for inspections and maintenance. RTs may
2 have a lower priority for frequency of inspection. These are Verizon’s own stated
3 standards regarding battery maintenance.

4 The FCC, in its rescinded Order regarding backup power, developed only the most
5 general standard for frequency of inspections and maintenance, requiring that “the
6 provider has implemented reasonable methods and procedures to ensure that the power
7 sources are regularly checked and replaced when they deteriorate.”³¹

8 The Commission, in its Backup Power Report developed standards for frequency
9 of maintenance of batteries. In regards to batteries serving customer premises equipment
10 (“CPE”), the report recommends annual tests “to confirm that the battery is retaining
11 sufficient capacity and recharge capability over time.”³² RT backup batteries are more
12 critical than backup batteries for CPE, as thousands or tens of thousands of customers’
13 service depend on RT batteries, whereas CPE batteries affect only individual customers.
14 Thus, the standard for RT batteries should be at least as stringent, if not more so, than the
15 annual inspection standard discussed for CPE backup batteries.

16 The Backup Power Report also identified many NRIC Best Practices related to
17 backup power, including the following:

18 Network Operators and Service Providers using Valve
19 Regulated Lead Acid (VRLA) batteries should perform
20 annual maintenance by performing a discharge test or by
21 using an ohmic test instrument.³³
22

23 VRLA batteries are the most common type of batteries used to backup RTs.³⁴

³¹ See FCC Katrina Panel Order, ¶ 25 & Appendix B, proposed rule §12.2.

³² Backup Power Report, p. 36.

³³ See Backup Power Report, p. 160, referencing NRIC Best Practice 7-7-0623. This standard was re-adopted verbatim by the CSRIC as Best Practice 9-7-0623, in CSRIC IV, Working Group 7, Legacy Best Practices Updates, Final Report – Legacy Best Practices, p. 42, available at <<https://transition.fcc.gov/pshs/advisory/csric4/CSRIC%20IV%20WG7%20Legacy%20Best%20Practices%20Final.pdf>>

³⁴ See Backup Power Report, pp. 54, 98.

1 Given the analyses discussed above, it is reasonable for Verizon and Frontier to, at
2 a minimum, inspect and provide maintenance to RTs on annual basis. However, Verizon
3 has not inspected many of the batteries that serve Verizon’s RTs on an annual basis. Of
4 the <<BEGIN CONFIDENTIAL>> [REDACTED]
5 [REDACTED] <<END
6 CONFIDENTIAL>> Many other batteries had longer periods since their last service,
7 which can be seen in the data in Figure 1 below.

8 <<BEGIN CONFIDENTIAL>>

[REDACTED]

9
10 <<END CONFIDENTIAL>>

11 A few counties contained a disproportionate amount of batteries that had the most
12 recent service dates over a year ago. <<BEGIN CONFIDENTIAL>> [REDACTED]

13 [REDACTED]
14 [REDACTED]
15 [REDACTED] <<END CONFIDENTIAL>>

³⁵ See Backup Power Data Response, attached as Exhibit SC-1.

1 **F. Duration of Backup Power at Remote Terminals.**

2 The Backup Power Report examined industry practices regarding the provision of
3 backup power to central offices and RT. Generally, in the event of a local power outage,
4 the RTs are powered by rechargeable batteries. The duration that batteries deliver power
5 is a factor to consider. For example, if a battery can deliver power to meet a RT's needs
6 for eight hours, as long as the local power outage lasts eight hours or less, telephone
7 service will not be compromised on the network side.

8 Service providers may have additional means of extending the duration of backup
9 power available to RTs. Sometimes RTs will also have a generator on-site that can
10 recharge the batteries or otherwise extend the time during which backup power is
11 delivered. As will be discussed in the section below, the on-site generator will operate
12 for as long as the fuel tanks contain fuel. A service provider may also have a contingency
13 plan for delivery of additional fully-charged batteries, additional portable generators, or
14 additional fuel for on-site generators in the case of a long-term power outage.

15 As discussed above, the FCC's Katrina Panel Order would have required a
16 minimum of eight hours of backup power at all RTs. The Backup Power Report reported
17 on its survey of telecommunications service providers:

18 This review recognizes the currently implemented industry
19 best practices for back up power at RT ... facilities: ...
20 • 4 hours (minimum) of backup reserve capacity at remote
21 terminals with an objective of 8 hours at critical sites.³⁶
22

23 However, the Backup Power Report found higher standard of practices for larger service
24 providers:

25 General conclusions for telecommunications service
26 providers were that: ...
27 • Most RT sites of wireline providers use the 8 hours of
28 backup power as the design criteria for:
29 o 95% of RT nodes of larger service providers
30 o >80% of RT sites of medium and small providers

³⁶ Backup Power Report, p. 10.

1 • Some critical RT sites had 12 hours reserve designed into
2 them and/or had external hookups points for additional power
3 or portable generators (gasoline, natural gas or propane
4 powered).³⁷
5

6 The Backup Power Report also considered the duration of most power outages
7 affecting telecommunications service, although it made this analysis when considering
8 outages affecting CPE. However, the analysis of local and regional power failures that
9 affect individual customers' CPE should be applicable to outages affecting RTs. In
10 considering the duration of outages, the Backup Power Report recommended that backup
11 batteries for CPE should have at least eight hours of standby time.³⁸

12 Thus, based on both the FCC's and the Commission's findings, a general standard
13 applicable on large service providers is the provision of eight hours of backup power.
14 The provision of eight hours of backup power at RTs may be achieved with the use of
15 batteries with at least eight hours of capacity. Alternatively, a RT may have a battery
16 with capacity of less than eight hours, but with a generator also on-site, that provides
17 additional backup power for a longer duration of time.

18 Of the <<BEGIN CONFIDENTIAL>> [REDACTED]

19 [REDACTED]
20 [REDACTED] <<END

21 CONFIDENTIAL>> However, many of these RTs with battery time under eight hours
22 also have generators present, which could extend the time of the batteries above the
23 eight-hour standard. ORA is particularly concerned with the RTs with less than eight
24 hours of battery time that also lack a generator on-site. For these RTs, in the event of a
25 power outage, the RT would provide telecommunications service only as long as the
26 backup battery had capacity to deliver power. Of the <<BEGIN CONFIDENTIAL>>

27 [REDACTED]

³⁷ Backup Power Report, p. 59.

³⁸ See Backup Power Report, pp. 36-41.

³⁹ See Backup Power Data Response, attached as Exhibit SC-1.

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12

[REDACTED]

[REDACTED] <<END

CONFIDENTIAL>>

As discussed above, generators located on-site at RTs may extend the duration of backup power in the case of a power outage. Overall, <<BEGIN CONFIDENTIAL>>

[REDACTED]

<<END CONFIDENTIAL>> The vast majority of generators located at Verizon’s RTs had been serviced within the past year. The duration that generators may operate without outside intervention is limited by the amount of fuel available on-site. The vast majority of RT generators had the capacity to run for at least <<BEGIN CONFIDENTIAL>>

[REDACTED] <<END

CONFIDENTIAL>>

G. Proposed Conditions Regarding Backup Power for Remote Terminals.

The provision of backup power for RTs is a critical matter affecting the continuity of service during power outages, and thus, public safety. If a power outage affects a RT, customers who depend on that RT will only have telecommunications service for as long as the RT has backup power. The provision of backup power is an important part of a service provider’s network. The Commission should ensure that Verizon’s network, should it be transferred to Frontier, be in a condition to support minimum standards of service quality and safety.

One area where Verizon’s network is sub-standard, as discussed above, is regarding the frequency of inspection and maintenance of RT backup batteries. Batteries can fail for a variety of reasons, and frequent inspections are needed to ensure that they are still operable. Otherwise, in the interim between inspections, a battery may have

⁴⁰ See Backup Power Data Response, attached as Exhibit SC-1.
⁴¹ See Backup Power Data Response, attached as Exhibit SC-1.
⁴² See Backup Power Data Response, attached as Exhibit SC-1.

1 degraded or become inoperable, jeopardizing the continuity of service and public safety
2 in the case of a local power outage.

3 If the Commission approves this transaction, it should require that:

4 Prior to the effective date of the transaction, Verizon shall
5 inspect and provide any needed service to any batteries
6 serving remote terminals that were last inspected or serviced
7 over one year ago. Thereafter, Frontier will conduct annual
8 inspections on all its remote terminals' batteries, with more
9 frequent inspections for any remote terminals that are critical
10 components of the network.

11
12 Many of the batteries serving Verizon's RTs are old, as discussed above. Older
13 batteries are more likely to fail. If the Commission approves this transaction, it should
14 require that:

15 Prior to the transaction, Verizon shall inspect all batteries
16 serving remote terminals that have components installed
17 before 2006, and shall provide service to and/or replace all
18 batteries that are substandard.

19
20 The Commission should also ensure that backup power at RT should be provided
21 for a sufficient duration to cover a reasonable majority of outages. Based on existing
22 standards, eight hours should be the minimum duration of time that backup power should
23 be provisioned. There should be a contingency plan to ensure that some other source of
24 backup power – either a generator on-site or the immediate delivery of additional
25 batteries or a generator – be available for each RT before the battery time at that RT runs
26 out.

27 If the Commission approved this transaction it should require that:

28 Within 180 days the effective date of the transaction, Frontier
29 shall provide for at least eight hours of backup power at all of
30 its remote terminals, through any combination of batteries,
31 generators or other resources. Remote terminals considered
32 to be critical should be provided with backup power of at
33 least 24 hours duration.

1 **Attachment A - Statement of Qualifications of Enrique Gallardo**

2 Enrique Gallardo received a Bachelors of Arts in Sociology in 1991 from the University
3 of California at Berkeley. Mr. Gallardo received a Juris Doctor degree in 1997 from the
4 University of California at Berkeley (Boalt Hall) School of Law. From 2001 to 2008,
5 Mr. Gallardo was Staff Attorney with Latino Issues Forum. His work there involved
6 participating in California Public Utilities Commission proceedings involving
7 telecommunications and low income programs, including performing analysis of
8 telecommunications policies and low-income programs. From 2010 to 2014, Mr.
9 Gallardo was Legal Counsel with the Greenlining Institute. At the Greenlining Institute,
10 Mr. Gallardo participated in California Public Utilities Commission proceedings
11 involving telecommunications and energy. His work included policy and program
12 analysis, drafting and sponsoring testimony and drafting comments and briefs. Mr.
13 Gallardo was hired as a Public Utilities Regulatory Analyst with the Office of Ratepayer
14 Advocates, Communications and Water Policy Branch, in April 2015.

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